

OKLAHOMA
AGRICULTURAL AND MECHANICAL
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AGRICULTURAL EXPERIMENT STATION

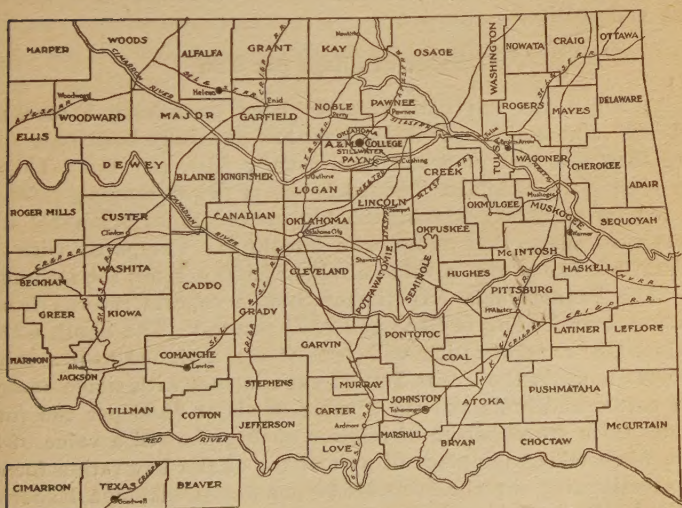
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SILAGE FEEDING

BY C. I. BRAY

DEPARTMENT OF ANIMAL HUSBANDRY



LOCATION OF A. & M. COLLEGE AND SIX SECONDARY AGRICULTURAL SCHOOLS

STILLWATER, OKLAHOMA

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Department of Animal Husbandry

Benefits of Silage Feeding

Silage is much relished by stock, especially by cattle and sheep. It is palatable, cheap and succulent, thins and cools the blood, improves the handling qualities of skin and hair, tones up the digestive system, and improves the health generally. Breeding females are put in good condition for producing healthy offspring, and after parturition are better able to give plenty of milk than when on a totally dry ration. To a large extent it is a preventive of digestive troubles, and with dairy cows it lessens considerably the chances of milk fever and garget. Silage-fed steers have brought from 20 cents to 50 cents per hundred more than steers fed dry roughage only, owing to the better finish and quality.

Value of Silage per Ton

As silage has not until recently been considered a marketable feed, the value assigned it in the past has generally been only a little more than the cost of production, usually \$3.00 per ton. This past year many tons of silage changed hands at prices ranging from \$8.00 per ton up to \$12.00, which probably proved more profitable to the growers of silage than those who bought it. Compared with other feedstuffs it has shown a value of about \$6.00 per ton for feeding cattle. The Pennsylvania Experiment Station reports returns from silage for steer feeding of \$4.65 and \$5.73 per ton. The South Carolina Station, also experimenting with beef steers, assigned to it a value of \$6.86 per ton. At the Texas Station experiments with silage compared with cottonseed hulls showed a value of about \$6.00 per ton for the silage. Corn stover silage of inferior quality showed a value of \$5.60 a ton when taking the place of part of the alfalfa hay ration for dairy cows, estimating the alfalfa at \$16.00 per ton (Oklahoma Experiment Station). Probably good silage may be worth as much as \$8.00 per ton. Missouri Station experiments recently published indicate that a ton of silage is approximately equal to half a ton of clover hay for steer feeding, and that the dry matter in silage yielded 50% more value than a ton of dry matter from shock corn. Corn silage has

proved to have nearly the same value per ton as cottonseed hulls. This does not mean that it is not as valuable a feed, but that owing to the greater amount of water in the silage it should sell for a slightly lower price per ton. At the Oklahoma Experiment Station, where cows received silage only as roughage, three tons roughage equaled approximately one ton of alfalfa hay.

Silage, while a first class feed, should be considered only as a roughage containing a relatively small amount of dry matter. The real value of silage lies in the low cost at which it can be produced rather than in any high feeding value per ton. Many think when silage has considerable grain in it that no concentrate feeds are necessary when silage is fed. This is a mistake, as stock are better able to make use of grain feed when getting silage than when fed dry roughage. While silage may be fed without roughage in addition, it is usually better for winter feeding to let stock have some dry fodder, such as hay, straw or fodder corn in addition to silage. The amounts of silage usually fed to stock are as follows (see last page): Beef cattle thirty to forty-five pounds; dairy cattle thirty to fifty-five pounds; sheep two to five pounds; horses fifteen to twenty pounds. (The amounts indicated are for 1,000-pound cattle or horses or 200-pound sheep receiving no other roughage.)

Corn silage combined with cottonseed meal has proved to be one of the cheapest and most profitable rations for fattening steers that is available to Oklahoma farmers. The following table shows the profits made with this ration as compared with meal and hulls at different Stations:

Station.	Year.	Gains per Steer per Day.		Cost per Pound Gain.		Profit per Steer.	
		Silage.	Hulls.	Silage.	Hulls.	Silage.	Hulls.
North Carolina..	1909-10	1.35	1.43	16.0c	16.1 c	\$ 9.20	\$ 8.58
North Carolina..	1910-11	1.23	1.45	15.1c	14.19c	6.79	.31
North Carolina..	1911-12	1.69	1.28	9.8c	13.7 c	11.11	2.65
South Carolina..	1911-12	2.18	1.5	6.4c	11.9 c	7.50	.01
Texas	1911-12	2.03	1.98	7.3c	10.0 c	10.40	.67
Oklahoma	1911-12	2.18	1.87	5.6c	8.2 c	-----	-----

The silage was valued at \$2.50 and \$3.00 per ton in these experiments, while the hulls were valued at \$6.00, \$7.00 and \$8.00 per ton respectively. In only one instance would the silage rations have proved profitable had the silage been priced at \$7.00 per ton. Had a small amount of dry roughage been fed with the silage, and also some corn, especially to finish off on, the gains could undoubtedly have been made much larger, but it is doubtful whether the profits would have been increased. At the Purdue Experiment Station the addition of corn silage to a ration of shelled corn, cottonseed meal and clover hay increased the rate of gain, decreased the cost and finished the cattle equally as well as the dry ration. The more corn silage that was used and the less clover hay, the cheaper were the gains pro-

duced. Where silage alone was used the gains were slightly less and the cattle were not so well finished, but they made a greater profit. These results would indicate that corn silage is a value feed for steers. Curtis of the North Carolina Station found that fattening steers could be carried through a longer feeding period on cottonseed meal when silage was fed than when hulls were the only roughage.

At the Pennsylvania Station what was called a half silage ration of eight to ten pounds per day was compared with a full ration of sixteen to twenty pounds per day, the steers being fed what hay and corn stover they would clean up in addition. The lot getting the half silage ration sold for 25 cents per hundred more than the others, but cost 45 cents per hundred more to fatten. At the North Carolina Station the steers began on thirty-two to thirty-five pounds of silage per day and were increased to about fifty pounds per day, with three pounds of hay in addition. The cattle getting hulls ate thirty pounds of hulls with no hay. At South Carolina Station they ate thirty-five to forty-five pounds of silage per day.

Feeding Silage to Hogs

Hogs are not well adapted to bulky feedstuffs and do not get very much out of silage. For breeding stock in winter, silage affords a substitute for pasture grass and will be eaten to a considerable extent, especially if rich in grain. A prominent Poland China breeder of Illinois claims that his hogs eat silage and relish it, and that it puts them in good condition. He feeds a bushel basket of silage to ten hogs each day and lets them root it over, though they do not eat all of it. It is good for the hogs, but should not be depended upon very largely for nourishment. Practically a full grain ration is required along with silage.

Clover and alfalfa silage have been found more useful than corn silage in hog feeding, as it is eaten better by the hogs. At the Kentucky Experiment Station a ration of shelled corn and corn-and-say-bean silage made better gains than a shelled corn ration. One hundred pounds of silage took the place of twenty-two pounds of corn.

Feeding Silage to Horses and Mules

Silage is a valuable feed for horses when well made and free from mold, but is not as well adapted to horses or mules as it is to cattle. Horses should not be fed more than twenty pounds per day. Moldy silage will kill mules and horses, producing symptoms similar to spinal meningitis, from which so many horses died in Oklahoma, Kansas and Colorado two years ago. Silage is not as well suited to work horses as to other stock, but it will take the place of pasture grass for young, growing stock and brood mares in winter. W. S. Boles of Enid, the Percheron breeder, is reported to feed his horses silage, and

feeds his colts and breeding stock all the ensilage they will eat, and says they like it better than alfalfa. A ration made up of twenty-one pounds of ensilage, fifteen pounds of corn, two pounds of bran and one pound of cottonseed meal proved a very efficient ration at the North Carolina Station. The cost of the ensilage rations fed to horses was less than for the hay rations. When the ensilage and corn were fed alone the ensilage ration proved slightly inferior to the clover hay ration, but by adding bran and cottonseed meal the deficiency was made up. In every case where corn ensilage was added to the rations there was a decrease in cost of feed, and in no case was there any harm done from the silage. At the Pennsylvania Station cottonseed meal and silage was fed to horses in addition to other feeds with very good results. Five pounds per day of the silage was used to start with. This was gradually increased to twenty pounds per day, which was about as much as the horses would eat. The silage was fed in the morning, so that any possible digestive disorders would be noticed. Horses fed silage consumed less grain, made their gains at less cost per pound, and were sleeker and better finished than when fed on rations not containing silage. The conclusions drawn were that if silage is made from mature corn and free from mold it can be fed to horses safely. They should be accustomed to it gradually, and the deficiency in protein should be made up with some nitrogenous concentrate. F. P. Lane, an Oklahoma A. and M. College graduate of 1913, now county adviser, Harvey county, Kansas, reports that many horses in that county were carried through the winter (1913-14) on nothing but silage and wheat straw.

Silage for Sheep

Silage is admirably adapted for sheep feeding. Sheep, like cattle, are ruminants, and made better use of bulky feeds than horses and hogs. They are not able to make as good use of coarse, dry fodders as are cattle and horses. Silage is relished by sheep and is a cheap and efficient roughness for wintering ewes. A pen of breeding ewes at the Oklahoma Experiment Station fed five pounds of silage each per day and one-half pound of cottonseed meal were carried through a considerable part of the winter at a cost of 1.27 cents per day; gained nearly one-half pound per day at a cost of 3.1 cents per pound gain. They dropped as large and healthy lambs as a pen fed three pounds of alfalfa hay and one pound of corn chops each. The cost of feed per day with the alfalfa lot was 3.06 cents, and while the rate of gain was slightly higher, the cost per pound of gain was 4.8 cents. Silage with a little alfalfa hay and cottonseed meal makes a good, cheap ration for ewes that are suckling lambs. The average of two years' silage feeding at the Indiana Station showed that ewes fed silage gained more during the winter and produced slightly heavier fleeces than those fed corn stover. The birth weights of the lambs from the silage lots were slightly greater than from the corn stover lot. For fatten-

from silage-fed cows for fear it would taint their condensed milk. They have recently withdrawn their objection to milk from silage-fed cows, provided that the silage is fed after milking, so that there will be no silage odors in the barn at milking time. Milk is particularly susceptible to odors, and if kept in a room where silage is may absorb a slight taste in this way. For this reason most silos in dairy establishments are placed outside of the barn and separate from it, no silage being allowed in the barn during milking time.

Relative Value of Crops for Silage

Good corn silage of the kind put up in the corn belt is undoubtedly superior to any other kind, but unfortunately the corn crop of Oklahoma cannot be depended upon. Kafir and cane silage may be considered satisfactory substitutes for corn silage in Oklahoma, as they are more sure, but since it yields much more forage per acre throughout the greater part of the State, it must be considered superior to Indian corn as a silage crop. Cowpeas and alfalfa, while they do not make first class silage alone, make a good addition to the regular silage crops when used at the rate of one part of the former to two or three parts of corn, cane or kafir.

Corn silage, kafir silage and cane silage were compared at the Kansas Experiment Station, the results showing that corn silage of good quality was superior to either cane or kafir silage, that the kafir silage ranked second for milk cows and the cane silage third. The cane silage fattened the cows more than the other feeds, showing that it might be better for beef cattle or sheep. The average corn silage of this State would not likely be as good quality as the corn silage used in the Kansas experiments. In steer-feeding experiments conducted at Oklahoma Station, 1913-14, corn and kafir silage mixed gave best results, kafir silage next, and kafir and peanut silage last.

Some Representative Silage Rations

	Silage Pounds.	Hay or Fodder. Pounds.	Oat Straw. Pounds.	Corn or Kafir Chop. Pounds.	Wheat Bran. Pounds.	Cottonseed Meal. Pounds.
Dairy cows (3 gals. milk per day).....	30-40	10		3	2	1
Dairy cows (1½ gals. milk per day).....	45		10			3
900-pound fattening steers, 90-day feeding period	20-30	6		6-12		3-5
800-pound fattening steers, 5-month feeding period	30	5		3		3
Beef breeding cattle, per 1,000 pounds live weight	30-40		10-15			½
Breeding ewes, winter ration, 200 lbs. weight	5					¾
Fattening lambs, 100 pounds live weight	2	1		1		1
Work horses, 1,000 pounds live weight	20	6-8		8		2